



Mansoura University
Faculty of Engineering
Electronics and Communications Dept.

First Term
Date: 20-January- 2013
Time: 3 Hours
Full mark: (70)

Exam. Of (Humanity 3)
For 3rd year Grade Electronics and Communications Dept. Students

Answer ALL the following Questions:

1. a. Using the grammar below, draw a syntax tree for the following string:
((id.id).id(id)(()))

$$\begin{aligned} S &\longrightarrow E \\ E &\longrightarrow id \\ &| (E.E) \\ &| (L) \\ &| (\\ L &\longrightarrow LE \\ &| E \end{aligned}$$

1.b. Give a right most canonical derivation for the string in part (a).

2.a. Enforce the standard arithmetic precedence rules and remove all ambiguity from the following grammar

$$S \longrightarrow S+S|S/S|(S)|-S| S^{\wedge}S |number$$

2.b. Define a compiler. Explain its function. State qualities required in compiler.

3.a. Draw the NFA diagram for the following regular expressions:

- (1) $(a/b)^*abb$
- (2) $(aa)^*/(bb)?$
- (3) $(a^+/c^+)b^+$

3.b Consider the following grammar:

$$\begin{aligned} S &\longrightarrow E+S | E \\ E &\longrightarrow number | (S) | -S \end{aligned}$$

Give the left most derivation for the sentence $1+(2+(3+4))+5$, Then draw syntax tree.

4.a. Derive regular expression for (5230,11.2 e +4).

4.b. Construct DFA for $(a^*b^*c^*)$, Then give the minimal DFA.

5.a Consider the following grammar for Boolean expressions::

E \rightarrow E OR E
| E AND E
| NOT E
| (E)
| TRUE
| FALSE
| ID

Show that this grammar is ambiguous.

5.b. Rewrite the grammar to remove the ambiguity

Good Luck
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